

Make Networking a Critical Strategic Infrastructure Resource for Enabling Digital Business

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Since enterprises' digital business initiatives rely on agile, robust connectivity, networking will become an increasingly critical enabler for such activities. CIOs must ensure they have the right networking people, processes, technology and investments to drive and not inhibit these initiatives.

Key Challenges

- Digital business initiatives will struggle unless CIOs and business leaders change the way they think about networking.
- Networking has traditionally been managed as a cost center that must be tightly controlled as part of "IT costs." This has caused the incorrect branding of networking as a "back office" function that primarily serves a "utility role" in enterprises' digital initiatives.
- A culture of avoiding risk has prevented enterprise networking teams from keeping pace with business requirements, and has additionally promoted a culture that discourages risks and change — a constant in digitalization.

Recommendations

CIOs focused on digital business initiatives must:

- Assign network planners and/or architects from the outset for all digital business initiatives by partnering them with line-of-business teams to collaboratively develop robust, extendible and resilient networking solutions.
- Prioritize agile and reliable connectivity to customers and supply chain partners by emphasizing more investment and solution-oriented models to fund network expansion and improvement, and be prepared to discuss these plans with the CEO and board.

- Shift the IT organization and networking culture from one that is risk averse to one that encourages responsible, forward-looking efforts.

Strategic Planning Assumption

By 2022, the percentage of enterprises that deem networking core to their digital initiative success will increase to over 75%, compared to less than 25% in 2017.

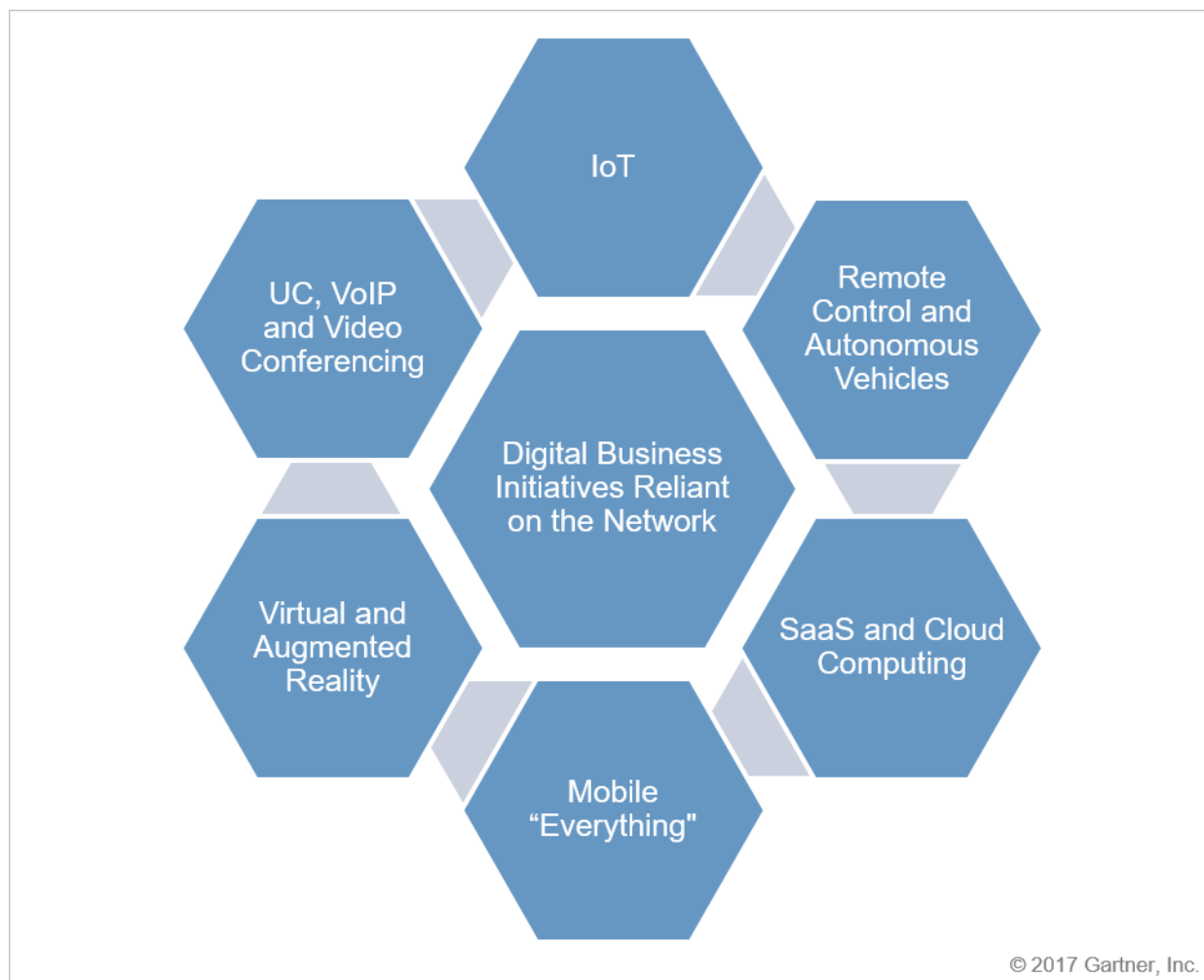
Introduction

Just a few years ago, the idea of optimizing or becoming a more digital business was speculative for most enterprises. But it is now becoming a reality for a significant proportion of CEOs. According to Gartner research, nearly 50% of CEOs are experiencing board pressure to make faster progress toward digitalization. Over 35% of CEOs have felt the need to respond by creating a chief digital officer (CDO) position.

Additionally, the 2017 CIO Survey shows that CIOs are shifting their investment patterns in response to digitalization. The typical CIO is already spending 18% of his/her IT budget in support of digitalization, with that number expected to increase to 28% by 2018. By way of comparison, top-performing enterprises (those where digitalization is fully baked into their planning processes and business model) are already spending an average of 34% of their IT budget on digital activities, which is expected to increase to 44% by 2018. While the precise elements of the IT budget are open to discussion, it's clear that digitalization is becoming increasingly central to CIOs' planning and investments, and networking will be a critical element. Indeed, many of the *digerati* ("born digital" companies such as Google, Facebook, Amazon, Alibaba and Tencent) have invested in additional networking capabilities, including fiber backbones, low earth satellites and high-speed wireless offerings.

While a relatively small percentage (8%) of the overall IT budget is devoted to networking (see Evidence), it has always been a key component of IT (see Note 1). But with the emergence of digital business, agile, resilient networking is becoming essential for participating in a faster, more dynamic and highly networked digital ecosystem. Conversely, a poor network can inhibit digital business efforts. With that, the impact of networking is often underestimated in digital business initiatives (see Figure 1 for a list of digital business initiatives reliant on networking).

Figure 1. Networking and Digital Business Initiatives



Source: Gartner (July 2017)

Gartner defines digital business as the creation of new business designs by blurring the boundaries between the digital and physical worlds through the convergence of people, business and things. Networking enables digital business by providing connectivity among customers, employees, partners and things.

Networking must therefore be a key consideration for all digital business initiatives. This involves not only focusing on technical product specifications and selection, but also architecting enough flexibility and capacity to make networking a strategic investment. This will also require cultural and process changes that enable ongoing operational evolution.

Digital business is supported by technology platforms in five areas (see Figure 2), all of which require robust "extensions" or overlays to traditional enterprise networks. Table 1 shows how networking can impact each technology platform.

Customers

Partners

Employees

Things

Customer Experience Platform

Ecosystems Platform

Information Systems Platform

IoT Platform

Data and Analytics Platform

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- **Customer experience platform** — Contains the main customer-facing elements, such as customer and citizen portals, multichannel commerce and customer apps.
- **Data and analytics platform** — Contains information management and analytical capabilities. Data management programs and analytical applications fuel data-driven decision making, and algorithms automate discovery and action.
- **Ecosystems platform** — Supports the creation of, and connection to, external ecosystems, marketplaces and communities. Application programming interface (API) management, control and security are its main elements.
- **Information systems platform** — Supports the back office and operations, such as enterprise resource planning (ERP) and core systems.

- **IoT platform** — Connects physical assets for monitoring, optimization, control and monetization. Capabilities include connectivity, analytics and integration to core and operational technology (OT) systems.

Table 1. Network Impact on Digital Business Building Blocks

Digital Business Technology Building Block	Desired Networking Impact
Customer experience platform	Enablement of the underlying connectivity to enable customer portals and applications along with social networks.
Data and analytics platform	Networking infrastructure that supports real-time data collection and analytics engines with rapid response may be different from general purpose networks due to additional scale and low latency demands.
Ecosystems platform	A seamless network fabric for enterprise, industry and partner-run ecosystems, as well as networking capabilities that enable the use of APIs, which provides more flexibility than using traditional vendor proprietary command line interfaces.
Information systems platform	Resilient and scalable network connectivity for core internal systems, and connectivity for endpoint computing and employee collaboration and workplaces.
IoT platform	Scalable and latency-sensitive features that enable customer- and enterprise-connected things, including a device-agnostic network that enables many elements to exploit the network infrastructure and be seamlessly supported.

Source: Gartner (July 2017)

Network personnel should have a seat at the table when planning for these initiatives; otherwise, they may not fully appreciate all the requirements, and may not be in a position to help obtain the necessary funding to build the business case. To avoid broken budgets, failed initiatives, cost overruns and finger pointing, networking must be part of digital initiatives at the earliest possible stages.

Recommendations:

- Make networking considerations part of all digital business initiatives by integrating network personnel into line-of-business teams to coordinate efforts on digital initiatives (if staffing is limited, consider third-party assistance). This also involves the following:
 - Select personnel who have the versatility to interact with the lines of business, decipher networking requirements and collaborate with the business on networking solutions.
 - Develop a process where disagreements (around potential solutions) between the business and network area can be rapidly addressed.

Change Network Infrastructure Funding

The utmost attention must be placed on providing an agile, reliable network for the enterprise's digital initiatives. Operational costs for networks are important, but too much emphasis on cost optimization can often inhibit execution on future digital business initiatives. Execution requires agility in areas such as demand-based provisioning through virtualized, software-defined capacity requirements, as well as differing access to bandwidth and higher-quality circuits, based on specific application requirements. This will probably require CIOs to consider new technologies (see "Bring Web-Scale Networking Concepts to Your Data Center"). The question that must be asked for potential networking investments is: *What new opportunities or initiatives (for monetization, for example) does this network investment enable?* This will raise the level of analysis from a tactical focus to one that is more strategic and business-oriented. CIOs should therefore consider future-proofing network design investments of between three and five years into their plans.

Traditionally, networking has been viewed as an internal resource whose costs must be relentlessly diminished. However, modern networks are the mission-critical "highway" and the virtual lifeblood for delivering external digital products and services to consumers and business partners in nearly every industry, including:

- Software vendors moving to SaaS delivery, support and maintenance models
- Content/IP providers (for example, infotainment, intellectual property and advertising)
- Financial services (banks and insurance companies) and other transactional exchanges, such as airline or hotel reservations, car and home sharing (for example, Priceline, Expedia, Airbnb and Uber)
- Online retail environments (for example, Amazon and Alibaba)
- Search and social network providers (for example, Google, Facebook, Tencent/WeChat and Baidu)
- IoT providers doing remote monitoring of equipment (for example, Tesla, GE, Siemens and ABB)
- Online matching services for employment, home services and dating

Because the products and services enabled by these networks are responsible for significant revenue, the networks supporting them should be considered strategic investments that demand continuous updating and "painless" upgrading. These networks, which support increased resiliency, diverse connectivity options and expected speed/response times, generate revenue.

Gartner believes that network criticality will increase dramatically during the next five years as more enterprises accelerate their digital journey. Virtually all enterprises will increasingly connect their business services to customers, and thus they should consider exploiting different business and economic models to fund their network expansion and improvement. For example, at least some network expenditures (beyond employee connectivity to internal applications) should be considered "product/service investments" that are capitalized and amortized rather than expensed. And as noted previously, networking must be included early in the business justification for digital initiatives, not viewed as an afterthought utility.

Using traditionally tactical, incremental approaches to network funding will delay enterprises from executing more comprehensive digital strategies. Gartner has observed that organizations (especially the *digerati*) that are successfully executing their digital initiatives and transforming their respective industries are deploying different approaches. For example, the organizations listed above that have deployed flexible, cost-effective and scalable networks have most often incorporated networking requirements into the funding process for the overall service. Their "technology-driven" (vs. IT-centric) services require extensive networking to succeed, in some cases rising to the point of becoming a "software company." Traditional companies such as GE, Volvo, Siemens, ABB and Haier have acknowledged this approach, along with recent players like Tesla. This extends from planning (network investment justification) to execution (managing agile and resilient network fabrics underpinning the operational environment). While not everything done by these companies can (or should) be replicated, rethinking longstanding networking principles would be appropriate.

Since networking is core to digital business initiatives, it cannot be managed solely for cost optimization and be disconnected from business value. Moreover, these digital business-oriented network enhancements cannot be viewed as projects with a defined end date and patchy ongoing investments that relegate networking to utility status. They must be viewed as core to digital business products/services (see "Manage Your Foundation/Core System Investments as Products to Spur the Right Type of Innovation").

Recommendations:

- Prioritize agile and reliable connectivity to customers as networking grows more critical to the business by using nontraditional business and economic models to fund network expansion and improvement.
- Pursue new solutions based on innovative architectural approaches, such as software-defined wide area network (SD-WAN) and network function virtualization (NFV). Also consider how to leverage colocation hubs, internet exchange points and direct connections to cloud providers. Redirect savings from the automation of repetitive tasks to these newer technologies (see next section).
- Mandate that business cases must include provisioning the appropriate network infrastructure/service before the digital business initiative goes live.

Shift the Culture to Encourage Responsible Initiatives

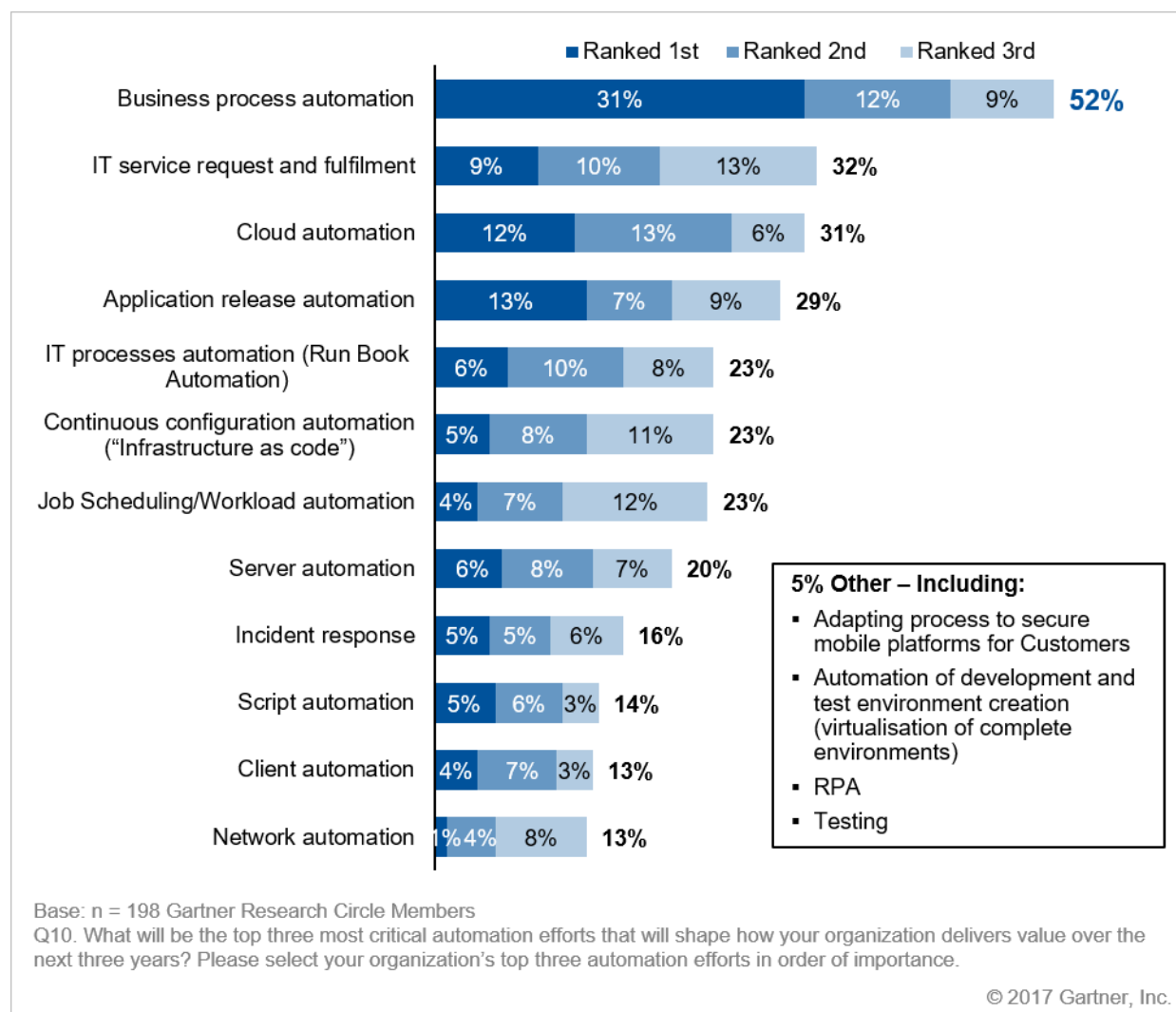
CIOs must break the culture of risk aversion and incrementalism that permeates traditional networking organizations. Gartner's client interactions highlight that of all IT functions, networking now tends to be among the biggest inhibitors to innovation (see the Evidence section). This is ironic because networking was once at the forefront of externalization (e-commerce) in the late 1990s, where mastering command line interfaces (CLIs) and vendor proprietary technology was key. Now the focus is on APIs and integrating different technologies.

A first step, as noted above, is to ensure assignment of senior networking personnel to business units' digitalization initiatives involving customers and partners. This becomes even more critical if

the aspiration or strategy is to develop a platform that will serve these groups in a broader way (through the use of applications, APIs, software updates/maintenance, data collection and analysis and security). This will help ensure that there is a fuller understanding of current and future networking requirements and urgency. The networking personnel must be responsive to business requirements and motivated in answering the "how," not asking the "why." They should also be prepared to help discuss and develop business models (such as leading indicator) and metrics to help justify network investments.

Accelerating automation will be a key building block enabler for digital business. Not only will it increase the provisioning speed for needed infrastructure resources, but it will also increase service availability through the reduction of human error, which is a major cause for outages. CIOs must stress the importance of increasing automation throughout their organizations. This is particularly true among the networking areas where network automation has lagged behind other areas.

Figure 3. Most Critical Automation Efforts for Organizations in the Next Three Years



Source: Gartner (July 2017)

CIOs must also emphasize applications that support business outcomes over technology components throughout all IT areas, but this is particularly needed in the networking domain. This demands an end-to-end focus on application/workloads to ensure that the right performance levels are being met and adequate capacity is available.

Infrastructure leaders should often consider flattening their organizations and not allowing networking to operate as a silo, with moats separating it from other areas. An approach to address this (along with addressing the aforementioned automation) is lifting and combining all automation efforts out of the different infrastructure groups (formally or virtually) and forming a "hyper-automation" group that is tasked with programming and automating the infrastructure (see ["NetOps 2.0: Embrace Network Automation and Analytics to Stay Relevant in the Digital Business Era"](#)).

To ensure the right skill set to build/buy and integrate network infrastructure, CIOs should make it easy for personnel to transition from other internal IT groups (for example, application development) to the infrastructure area (particularly networking). Pairing junior application developers with network subject matter experts can yield positive results in trialing new network capabilities and services.

CIOs should measure, reward and encourage innovation, focusing on metrics that measure the delivery of a service (for example, the time it takes to add a branch office, add a networking feature or change an access control list). From an operational standpoint, avoid overly emphasizing availability and metrics such as mean time between failures (MTBF). Instead, focus on metrics such as the time it takes to detect and respond to failures. The message is that it is fine to fail fast if the overall services are improving (see ["The Monitoring Metrics IT Operations Should Report On"](#)). Finally, adopt blameless post-mortems that review and learn from failures, not using the process in a punitive manner.

Recommendations:

- Stress versatility in staffing skills, not just personnel rooted in a specific technology but those with a business orientation who can easily develop an understanding of newer technologies. This includes encouraging lateral moves (for example, developers joining infrastructure areas that couple development skills with core infrastructure knowledge that result in programming infrastructure functions).
- Since automation is a key underlying enabler, stress the importance by instituting a mantra of automating all manual repetitive tasks.
- Track and reward around metrics that stress service responsiveness and delivery.
- Shift the culture within the networking group from one that is risk averse to one that maintains roots in safety and soundness but also encourages and rewards responsible, innovative initiatives.

Gartner Recommended Reading

Some documents may not be available as part of your current Gartner subscription.

"The 2017 CIO Agenda: Seize the Digital Ecosystem Opportunity"

"2017 CEO Survey: CIOs Must Scale Up Digital Business"

"Manage Your Foundation/Core System Investments as Products to Spur the Right Type of Innovation"

"It's Time to Shift Network Spend From Premium Products to Premium People"

"How to Reduce Network Downtime in the Era of Digital Business"

"Bring Web-Scale Networking Concepts to Your Data Center"

"How to Improve Data Center Network Agility Without Getting Fired"

"Digital Business and Cloud Demand New WAN Architectures"

"Building a Digital Business Technology Platform"

"2017 Strategic Roadmap for IoT Network Technology"

Evidence

This research is based on over 100 inquiries from April 2016 to March 2017 involving the networking area.

The following survey data was also used:

- Gartner IT Key Metrics Data (December 2016)
- IT Operations Automation Survey (February 2017). This survey focused on how organizations are evolving their strategies for IT process automation adoption — 198 survey respondents
- 2017 Gartner CIO Survey
- 2017 Gartner CEO Survey
- Gartner Data Center Conference (December 2016) Survey Questions
 - Which technology will have the most dramatic impact on your organization's network? (88 respondents)
 - How would your CEO describe your corporate WAN? (95 respondents). In response to this poll question, I&O leaders thought that only a third of their CEOs would consider their WAN good, and that a surprising 18% would not even know what a WAN is. This is despite the importance of the WAN in meeting digital business initiatives.
 - What percentage of your network changes are automated today? (68 respondents)
- We have had conversations with many of the companies mentioned in this document, during the conversations we have seen that these companies show the attributes that we recommend throughout the document where they are using their networks as a strategic resource.

Note 1 Networking Through the Ages

Networking was important during prior technology periods — from the birth of LANs in early to mid-1980s, to client server in the late 1980s and early 1990s and to e-commerce in the late 1990s and early 2000s.

More on This Topic

This is part of an in-depth collection of research. See the collection:

- Scaling Bimodal — Fusing IT With the Business: A Gartner Trend Insight Report

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